

Appl. No. : 10/672,469
Filed : September 26, 2003

IN THE CLAIMS:

Please cancel Claims 1, 4, 11 and 12 and please amend Claims 2, 5-6, 8-9 and 13-14 as follows:

1. (canceled)
2. (currently amended) ~~The electron beam exposure apparatus as claimed in claim 1,~~ An electron beam exposure apparatus for exposing a wafer by electron beams, comprising:

an electron beam generating section for generating a plurality of electron beams;

a plurality of deflectors for deflecting the corresponding electron beams;

a deflection control section for outputting a deflection control signal for causing said deflectors to deflect the electron beams; and

a control signal storage section for storing a value of the deflection control signal output from said deflection control section;

wherein said control signal storage section connects the plurality of deflectors in series when self-diagnosing electrical connections in the electron beam exposure apparatus by scanning the deflection control signal through the plurality of deflectors; and

wherein said control signal storage section and said ~~deflector~~ deflectors are monolithically integrated on a semiconductor substrate.

Appl. No. : 10/672,469
Filed : September 26, 2003

3. (previously amended) The electron beam exposure apparatus as claimed in claim 2, wherein said deflection control section outputs a plurality of deflection control signals, and said deflector comprises: an aperture penetrating through the semiconductor substrate through which the electron beam passes; and a plurality of deflecting electrodes provided in edges of said aperture for receiving the plurality of deflection control signals, respectively, said plurality of deflecting electrodes being electrically isolated from one another, and said control signal storage section stores the values of the plurality of deflection control signals.

4. (canceled)

5. (currently amended) The electron beam exposure apparatus as claimed in ~~claim 4~~ claim 2, further comprising a switch for switching whether the deflection control signal is to be supplied to said control signal storage section, wherein said deflection control section outputs the deflection control signal, which is a binary signal, which is to be stored in said control signal storage section when said switch supplies the deflection control signal to said control signal storage section, and said deflection control section outputs the deflection control signal, which is an analog signal, when said switch does not supply the deflection control signal to said control signal storage section.

6. (currently amended) The electron beam exposure apparatus as claimed in ~~claim 1, further comprising a plurality of said~~

Appl. No. : 10/672,469
Filed : September 26, 2003

~~deflectors~~ claim 2, wherein said deflection control section supplies a plurality of deflection control signals to said plurality of deflectors, and said control signal storage section stores values of the plurality of deflection control signals in parallel, and outputs them to said deflection control section in series.

7. (original) The electron beam exposure apparatus as claimed in claim 6, wherein said deflection control section further outputs a clock signal, said control signal storage section outputs a value of the deflection control signal according to the clock signal, and said deflection control section suspends the output of the clock signal when said deflector is deflecting the electron beam.

8. (currently amended) ~~The electron beam exposure apparatus as claimed in claim 6,~~ An electron beam exposure apparatus for exposing a wafer by electron beams, comprising:

an electron beam generating section for generating a plurality of electron beams;

a plurality of deflectors for deflecting the corresponding electron beams;

a deflection control section for outputting a deflection control signal for causing said deflectors to deflect the electron beams; and

Appl. No. : 10/672,469
Filed : September 26, 2003

a control signal storage section for storing a value of the deflection control signal output from said deflection control section;

wherein said control signal storage section and said deflectors are monolithically integrated on a semiconductor substrate;

wherein said control signal storage section stores values of the plurality of deflection control signals in parallel, connects the plurality of deflectors in series for scanning the deflection control signals through the plurality of deflectors, and outputs the deflection control signals to said deflection control section in series; and

wherein said control signal storage section comprises a shift register including a plurality of flip-flops provided corresponding to said plurality of deflectors, the flip-flops storing thereon values of the corresponding deflection control signals.

9. (currently amended) ~~The electron beam exposure apparatus as claimed in claim 6,~~ An electron beam exposure apparatus for exposing a wafer by electron beams, comprising:

an electron beam generating section for generating a plurality of electron beams;

a plurality of deflectors for deflecting the corresponding electron beams;

Appl. No. : 10/672,469
Filed : September 26, 2003

a deflection control section for outputting a deflection control signal for causing said deflector to deflect the electron beam; and

a control signal storage section for storing a value of the deflection control signal output from said deflection control section;

wherein said control signal storage section and said deflectors are monolithically integrated on a semiconductor substrate;

wherein said control signal storage section stores values of the plurality of deflection control signals in parallel, connects the plurality of deflectors in series for scanning the deflection control signals through the plurality of deflectors, and outputs deflection control signals to said deflection control section in series; and

wherein said deflection control section diagnoses ~~contact~~ electrical connections between each of said plurality of deflectors and said deflection control section based on the deflection control signals output from said control signal storage section.

10. (original) The electron beam exposure apparatus as claimed in claim 9, wherein said deflection control section identifies one of said deflectors which is not connected to said deflection control section.

11. (canceled)

Appl. No. : 10/672,469
Filed : September 26, 2003

12. (canceled)

13. (currently amended) The electron beam exposure apparatus as claimed in ~~claim 1~~ claim 2, further comprising a signal line for connecting said deflection control section and said deflector, said signal line including a deflection control signal input terminal on a semiconductor substrate on which said control signal storage section being formed.

14. (currently amended) ~~The deflection apparatus as claimed in claim 11, further comprising~~ A deflection apparatus for deflecting a plurality of electron beams based on a deflection control signal, comprising:

a control signal storage section storing thereon a value of the deflection control signal; and

a plurality of deflectors for deflecting the corresponding electron beams based on the deflection control signal; and

a signal line for connecting a deflection control section for generating said deflection control signal and said ~~deflector~~ plurality of deflectors, said signal line including a deflection control signal input terminal on a semiconductor substrate on which said control signal storage section being formed;

wherein said control signal storage section connects the plurality of deflectors in series when self-diagnosing electrical connections in the electron beam exposure apparatus

Appl. No. : 10/672,469
Filed : September 26, 2003

by scanning the deflection control signals through the series
connected plurality of deflectors.